

New NHI Highway Traffic Noise Course

Mark Ferroni
Highway Traffic Noise Team

ADC40/ 2005 Summer Meeting
A1F04 Seattle, Washington





FHWA HQ Noise Team

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FHWA – Office of Natural and Human Environment

HEPN-20, Room 3240

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Course Purpose

- This two-and-a-half-day introductory course is aimed at providing:
 - An overall understanding of various factors and attributes of a highway traffic noise study,
 - A practical, interactive training in the basic principles of noise analyses,
 - A basic understanding of the fundamentals of noise studies
 - Includes a final exam



Course Development Team:

- National Highway Institute
 - Mila Plosky
- University of Tennessee Team
 - Bill Bowlby, Bowlby & Associates, Inc.
 - Harvey Knauer, Environmental Acoustics, Inc.
 - Soren Petersen, Catseye Services
 - Jean Derco, University of Tennessee



Course Review Team

■ State DOTs

- Mariano Berrios, Florida DOT
- Ken Polcak, Maryland SHA
- Bill McColl, New York State DOT

■ FHWA

- Chris Corbisier, HQ
- Mark Ferroni, HQ
- Dan Harris, San Francisco RC
- Jeff Lewis, California Division
- Sharon Love, Washington Division
- Mike Roberts, Atlanta RC
- MaryAnn Rondenella, Denver RC
- Bill VanLuchene, Alabama Division



Availability, Cost and How to Host/Obtain Course

- Pilot in February 2006 (Orlando, FL)
- Availability expected: Spring 2006
- Cost: \$335.00/attendee
- How to host/obtain the course:
www.nhi.fhwa.dot.gov/



Lesson 1

■ Basic Acoustics and Terminology

(2 hours, 45 mins.)

- Amplitude, frequency and time variation
 - Related to decibel, A-weighting, and equivalent sound
- Traffic noise sources, sound and propagation
 - Spreading, diffraction, reflection and refraction



Lesson 2

■ Federal Policies and Procedures

(2 hours)

- History of Federal legislation
 - NEPA, Federal-Aid Highway Acts, Noise Control Act
- 23 CFR, Part 772
 - Detailed section-by-section discussion
 - Incorporating FHWA policy and guidance



Lesson 3

- State DOT Traffic Noise Policy and Procedures *(1 hour)*
 - History and components of the State's highway traffic noise policy
 - This state specific lesson will be presented by the State's noise policy person



Lesson 4

■ Noise Study Requirements *(45 mins.)*

- Develop an outline of tasks involved in conducting a highway traffic noise study
 - Based on:
 - Lessons 1-3
 - Sample highway project
 - Class discussion to ensure a complete list of tasks



Lesson 5

■ Noise Measurement (*1 hour*)

- Why are measurements needed,
- When and how to conduct them
 - Duration, # of repetitions, weather, traffic data collection and documentation
- Basics of sound level instrumentation



Lesson 6

■ Basics of Traffic Noise Modeling and Impact Determination *(1 hour)*

- Introduction to traffic noise modeling
 - Basic parameters for modeling
 - Modeling concepts and steps
- Introduction to TNM Look-up Tables
 - Use and limitations



Lesson 7

- Introduction to the FHWA Traffic Noise Model *(1 hour, 30 mins.)*
 - Design features
 - Purpose and use
 - Types of windows and graphical views, menus, tool and status bar features, input options
 - Functionality
 - Calculation options, sound level contouring
 - Barrier design & parallel barrier modules



Lesson 8

- Noise Barrier Acoustical Concepts and Design in TNM *(1 hour)*
 - Acoustical goals
 - Issues related to barrier analysis
 - Barrier design goals
 - Barrier height, length & transmission loss
 - Effects of gaps, sound reflection/absorption
 - Noise reduction of walls vs. berms
 - TNM Barrier Analysis module



Lesson 9

■ Construction Noise *(45 mins.)*

- Identify and discuss requirements, assessment methods, mitigation techniques, monitoring methods
- FHWA and State requirements



Lesson 10

■ Public Involvement *(45 mins.)*

- Need for public involvement
- Means of interacting with the public
- Presentation techniques, materials, response, and follow-up procedures



Lesson 11

■ Noise Study Documentation (*45 mins.*)

- NEPA and Final Design reporting
- Typical contents of documents
 - Qualitative to Quantitative



Lesson 12

- Mitigation and Abatement, Part 1: Land Use and Source Control *(45 mins.)*
 - Basic concepts of NCLUP
 - Discuss successful programs & examples
 - Opportunities and challenges
 - Basic concepts of source control measures
 - EPA on new trucks
 - In-use controls such as engine compression brakes



Lesson 13

■ Mitigation and Abatement, Part 2: Project-Related Noise Abatement

(1 hour, 30 mins.)

- Available abatement techniques available
- Justifying recommended barriers
- Discuss the FHWA Highway Noise Barrier Design Handbook



Interactivity

- Group discussions
- Sample highway project
- Sound level meters
- Managing Road Noise - Interactive Graphics Teaching Component